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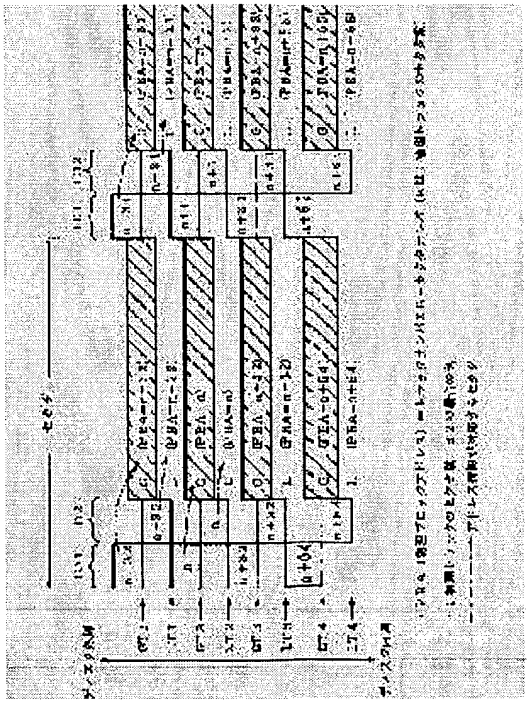
(54) DISK-LIKE RECORDING MEDIUM AND DISK DRIVE DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To effectively obtain the high density and large capacity when the MSR or land/groove recording is adopted.

SOLUTION: The reliability of the address reading operation is secured similarly to the conventional manner by recording 1st and 2nd addresses defined as the same address number in the header area, and additionally the adjacent distances of each address in the radial direction are expanded in such a manner that the 1st and 2nd addresses are arranged in the radial direction of the disk from a center line of a groove track or land track so as to be formed at the positions displaced in the opposite direction each other, then the effect of the crosstalk is eliminated. Thus, the redundancy of the head area is evaded, and the high density of the disk is promoted.



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* NOTICES *

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2.**** shows the word which can not be translated.
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CLAIMS

[Claim(s)]
[Claim 1] The sector as a data unit which a recording track is formed by the groove truck and the land truck, and is recorded on said recording track It is formed of the header field where preformat data were recorded, and the record playback field in which record playback of data is possible. The 1st address and 2nd address which were made into the same address number at least are recorded on said header field. And said the 1st address and said 2nd address The disk-like record medium characterized by being formed in the location by which the variation rate was mutually carried out to the disk radial to hard flow from the center line of said groove truck or a land truck.
[Claim 2] For said 1st address made into the same address number, and said 2nd address, one side is the disk-like record medium according to claim 1 characterized by considering as the address number corresponding to the sector on a groove truck, and the address number corresponding to the sector on a land truck in another side.
[Claim 3] Said record playback field is a disk-like record medium according to claim 1 characterized by forming the record layer so that a magnetic super resolution playback system may become possible.
[Claim 4] The disk-like record medium according to claim 1 characterized by not forming at least one side of said 1st address and said 2nd address in the border area of said zone while two or more zones are formed in the disk radial.
[Claim 5] The disk-like record medium according to claim 1 characterized by assigning the address which is logically different on said groove truck and said land truck in the range crossed to the inside of one zone, or two or more zones while two or more zones are formed in the disk radial.
[Claim 6] The sector as a data unit which a recording track is formed by the groove truck and the land truck, and is recorded on said recording track It is formed of the header field where preformat data were recorded, and the record playback field in which record playback of data is possible. The 1st address and 2nd address which were made into the same address number at least are recorded on said header field. And said the 1st address and said 2nd address As disk drive equipment corresponding to the disk-like record medium currently formed in the location by which the variation rate was mutually carried out to the disk radial to hard flow from the center line of said groove truck or a land truck With the address value read from said the 1st address and said 2nd address by head means to perform informational record or playback to said groove truck and said land truck, and said head means Disk drive equipment characterized by having the control means which the address of the sector of said groove truck or the address of the sector of said land truck is distinguished [control means], and performs the record actuation or playback actuation by said head means.
[Claim 7] It has the servo means which can switch the scan for the record or playback by said head means in the state of the scan to the scan condition over said groove truck, and said land truck. Said control means with the scan condition by said servo means, and the address value read from said the 1st address and said 2nd address Disk drive equipment according to claim 6 characterized by distinguishing the address of the sector of said groove truck, or the address of the sector of said land truck.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to disk-like record media, such as a magneto-optic disk, and the disk drive equipment which performs record or playback actuation corresponding to it.
[0002]
[Description of the Prior Art] In recent years, the densification of a record medium has been one technical problem, and various kinds of techniques for high density record playback are developed. For example, although the magneto-optic disk called an MO disk is mainly put in practical use for record playback of computer data, the magnetic super resolution playback system (MSR technique), and the land / groove recording method are developed as the technique of realizing densification in a magneto-optic disk.
[0003] A land / groove recording method is methods using both a land and a groove as a recording track. Although the method which a groove (slot) is beforehand formed as a recording track, and uses this groove as a recording track from before in a magneto-optic disk was adopted, recording density can be remarkably raised by making it between a groove and its next groove, i.e., also treating a land as a recording track.
[0004] A magnetic super resolution playback system (magnetic super resolution: MSR:Magnetically induced Super Resolution) is the technique which can read the recording information in a field smaller than a laser spot using the magnetic film with which the temperature characteristics differ. That is, even if the magnetic film with which such the temperature characteristics differ does not perform minor diameter-ization of the diameter of a laser spot to the media (MSR media) which have the record section made into the two-layer structure, the information by which high density record was carried out can be read.
[0005] Drawing 18 explains a MSR (magnetic super resolution) playback system. The recording track Dt with which the record mark M was formed in drawing 18 (a), and the laser spot SP irradiated on it are shown, and drawing 18 (b) shows a part of cross section of a magneto-optic disk. In order to acquire the effectiveness of MSR, as shown in drawing 18 (b), it is necessary to have the record layer from which a magneto-optic disk serves as a layer from which magnetic properties differ with temperature, respectively, an interlayer, and a playback layer. A playback layer is a layer which functions as a mask which covers the record mark M from the laser spot SP in the case of playback. A record layer is a record signal, i.e., the layer held as sense of magnetization of the information as a record mark M. An interlayer is a layer which controls association of a playback layer and a record layer.
[0006] At the time of playback, as for a playback layer, the sense of magnetization carries out the mask of the record layer by the set and this uniformly by adding a field from the exterior (front mask). If heat is applied to a disk by the laser spot SP here, the magnetization information on a record layer, i.e., the sense of magnetization of the record mark M, will be imprinted by the playback layer at a part of laser spot SP used as near the intermediate temperature of the heat distribution. By observing the sense of the magnetization imprinted by the playback layer, the record mark M recorded on high density also at the

big laser spot SP of the diameter of a spot can be read. Moreover, in the part from which the heat distribution by the laser spot SP serves as high temperature, a playback layer and a record layer are intercepted magnetically and a playback layer carries out the mask of the record layer by the external magnetic field (rear mask). If such a MSR technique is used, for example even if it is the same diameter of the beam spot as the former, high density record playback of more than twice can be attained, and the storage capacity of a magneto-optic disk can be made to raise sharply.

[0007]

[Problem(s) to be Solved by the Invention] However, in achieving densification by the MSR method or the land groove recording method, the following technical problems are left behind.

[0008] Although the storage capacity of a magneto-optic disk can be made to raise sharply by using a MSR method, the whole region of a magneto-optic disk cannot use a MSR method. A data unit called a sector as a fundamental data format on the disk in a magneto-optic disk shall be adopted, and the unit of a sector in the data stream formed on the truck of a disk shall continue. The sector is formed of PURIFOMATTEDDOHEDDA (only henceforth a "header") on which the preformat data based on an embossing pit were recorded, and the record playback field (it is called "MO area" on explanation) in which record playback of data is possible as an optical MAG field, as shown in drawing 19 . A sector address etc. is recorded on a header by the embossing pit. User data and others are recorded as a field which MO area can reproduce [a magneto-optic recording/].

[0009] It becomes MO area that the record film corresponding to a MSR method can be formed though natural in the sector of such a magneto-optic disk, and it cannot carry out a MSR method in a header. Furthermore with the magneto-optic disk, the area which has recorded system information and recording information beforehand is preformatted into the predetermined location by the side of a disk periphery and inner circumference, for example, and MSR cannot be used in such area. That is, PURIPITTO [in preformat area and PURIFOMATTEDDOHEDDA in a sector / the conventional recording density] since MSR is impossible.

[0010] Consequently, redundancy [as opposed to a disk in the area where PURIFOMATTEDDOHEDDA recorded beforehand the same byte of PURIFOMATTEDDOHEDDA, system information, and recording information by physical die length becoming long from the data of MO area, for example] will increase.

[0011] Moreover, the groove width of face of the magneto-optic disk of 5.2 G bytes of both sides is 0.55um(s) about, for example in groove recording method adoption. And as typically shown in drawing 20 (a), in the truck formed on Groove G, PURIFOMATTEDDOHEDDA is prepared in the head of each sector. At this time, the land L between a truck (groove G) and its next truck (groove G) had played the role of the shield to the cross talk from PURIFOMATTEDDOHEDDA of the adjoining truck. In addition, the address information by which the value was made the same as ID1 and ID2 is recorded twice on a header.

[0012] If the land / groove recording method which uses Land L as a recording track in addition to Groove G are considered making equivalent the pitch of Groove G - Groove G here, like drawing 20 (b), the same PURIFOMATTEDDOHEDDA as both the adjoining truck, i.e., a groove truck, and a land truck exists, and since there is nothing that is interrupted, under the effect of a cross talk, it will very be hard to read the address information of the sector currently recorded on the header, and it will be carried out. Thereby, record reproducibility ability and the seeking engine performance fall.

[0013] Like drawing 20 (c), the general evasion technique for this does not arrange PURIFOMATTEDDOHEDDA of a land truck and a groove truck with radial, but shifts either to the direction back of a truck by one header, and allots it to it. If it does in this way, the effect of a cross talk to the address read can be suppressed. However, a twice as many field as a header is needed for the head of each sector in this case, and redundancy becomes very large.

[0014] As mentioned above, when the redundancy by the redundancy by the preformat section in the case of MSR method adoption and the header, the cross talk evasion of a header in the case of a land / groove recording method, etc. is added and united, disk capacity will be lost 5% or more in **. That is, the effective increment in capacity is not realized only by adopting a MSR method, and a land / groove

record. Therefore, it has been a technical problem for large-capacity-izing how the redundancy by the header, its cross talk evasion, etc. is reduced.
[0015]
[Means for Solving the Problem] When this invention adopts a MSR method, and a land / groove record and improves recording density to such a situation, the data gestalt of a header is devised and it aims at realizing more effective large capacity-ization.
[0016] For this reason, the sector as a data unit by which a recording track is formed and the record medium of this invention is recorded on a recording track with a groove truck and a land truck It is formed of the header field where preformat data were recorded, and the record playback field in which record playback of data is possible. The 1st address and 2nd address which were made into the same address number at least are recorded on a header field. And the 1st address and 2nd address It is made to be formed in the location by which the variation rate was mutually carried out to the disk radial to hard flow from the center line of a groove truck or a land truck. That is, it avoids that secure the dependability of address read-out actuation as usual, cancel the effect of a cross talk etc. by arranging the 1st and 2nd address alternately on it, and a header becomes redundancy by recording the 1st and 2nd address (ID1, ID2) made into the same address number.
[0017] Moreover, be made to let the 1st address and 2nd address which were made into the same address number be an address number corresponding to the sector on a groove truck in one side, and an address number corresponding to the sector on a land truck in another side. Moreover, the record layer is formed so that it may become possible [a magnetic super resolution playback system (MSR method)] for a record playback field (MO area).
[0018] Moreover, while two or more zones are formed in the disk radial, in the border area of a zone, at least one of the 1st address and the 2nd address is not made not to be formed. Furthermore, in the range crossed to the inside of one zone, or two or more zones, the address which is logically different on a groove truck and a land truck is assigned.
[0019] The address of the sector of a groove truck or the address of the sector of a land truck distinguish, and it makes have the control means which performs the record actuation or the playback actuation by the head means with the address value read from the 1st address and 2nd address by head means perform informational record or playback to a groove truck and a land truck as disk drive equipment of this invention corresponding to such a disk-like record medium, and the head means.
[0020] Moreover, it has the servo means which can switch the scan for the record or the playback by the head means in the state of the scan to the scan condition and land truck to a groove truck, and a control means distinguishes the address of the sector of a groove truck, or the address of the sector of a land truck with the scan condition by the servo means, and the address value read from the 1st address and 2nd address.
[0021]
[Embodiment of the Invention] Hereafter, the gestalt of operation of the disk-like record medium of this invention and the disk drive equipment corresponding to it is explained in the following order.
1. Configuration 5. Record Playback Actuation of Arrangement Condition of Zone Configuration 2. Sector-Structure 3. Header of Disk, and Address Read-out Method 4. Disk Drive Equipment [0022] 1. Although the magneto-optic disk of the example of the zone configuration book of a disk is divided into radial in two or more zones, the zone structure is shown in drawing 1 . In addition, although a data modulation technique, an error correction sign method, and a sector size are greatly related when considering redundancy, it is premised on a sector format of a RLL (1 7) modulation technique, 16-byte length parity, and a 4-K byte sector by the disk of this example which explains the zone configuration and the sector structure below.
[0023] Although, as for a disk, a part for the core is made into the so-called clamping area and path clearance area, as the field to 27.00mm - 62.50mm is shown in drawing 1 , the zone format is specified from the path clearance area as a radius location from a periphery to the outermost periphery.
[0024] That is, it becomes a lead-out zone, an outer control truck SFP zone, an outer MANIFAKUCHARA zone, a user zone, an inner MANIFAKUCHARA zone, an inner control truck

SFP zone, a TORAJISHON zone, a PEP zone, and a RIFUREKUTIBU zone, in view of a periphery side.
[0025] The zone where a user performs record playback of various data as main data turns into a user zone. This user zone was divided into 18 zones of zone #0-#17 so that it might illustrate, it is performing record playback with a different clock for every zone, and the so-called zone CAV which minimum-izes the time of the recording density in a disk inside-and-outside periphery is adopted.
[0026] Let the outer control truck SFP zone and the inner control truck SFP zone be the preformat area where system information and recording information are recorded beforehand. Let an outer MANIFAKUCHARA zone and an inner MANIFAKUCHARA zone be zones including a guard band, the test zone for MANIFAKUCHARA, and the test zone for a drive.
[0027] A PEP zone is a zone in which only information read-out was formed possible in the condition that a tracking condition is not restricted, for example, it is that a pit mark aligns radial and is formed, and it sees to a circumferencial direction and a reflective bar code-like pattern is formed. And the disk information set to one of the management information as PEP data is recorded on this PEP zone.
[0028] The radius location range where each zone is arranged, the logic truck number in each zone, and the number of trucks come to be shown in drawing 2 . In addition, as this example, a track pitch is 0.68 (micrometer/bit), and explains supposing the example of 4096 bytes/a sector. Of course, it is not limited to this. "0" - "93059" is assigned to 93060 trucks [in / in a logic truck number / a user zone], and even "-1" - "-1568" is assigned by the periphery side from a user zone. Moreover, "93060" - "93585" is assigned by the inner circumference side from a user zone.
[0029] In addition, in this example, 1 logic truck means the range of 6 sector, and differs from the physical truck on a disk (1 circumference truck). A logic truck and the logical address (LBA:Logical Block Address) mentioned later are the addresses which are on record regeneration and a host device deals with, and, on the other hand, a physical truck and a physical address (PBA:Pysical Block Address) are values physically given on the disk. Although the logical address and a physical address correspond by 1:1 in principle, the logical address has a certain offset to the physical address. In order not to make the defective field or its shift field on a disk, the buffer area of a zone boundary, etc. access the reason for having offset from a host side, it is because the logical address is not assigned to those fields.
[0030] Drawing 3 shows the number of trucks, and the number of sectors about the zone (#0-#17) of 18 in a user zone. In addition, not only the groove G currently formed on the disk but the land L is treated as a recording track, and the disk of this example forms the record mark M for it, as a land / groove recording method is adopted and is typically shown in drawing 8 . For this reason, in drawing 3 , about each zone (#0-#17), a part of value about Groove G and value about Land L are divided, and it has written.
[0031] The number of physical trucks is set to 2640 for the whole (#0-#17) of each zone. That is, let the range of a 2640 physics truck be one zone. In addition, this is the value by which the groove truck and the land truck were set. The arrangement location of each zone (#0-#17) on a disk is shown as a radius location by the side of the inner circumference of the zone.
[0032] Since it is zone CAV as mentioned above, the numbers of sectors formed in one physical truck differ for every zone so that it may illustrate. For example, at zone #0, they are 31 sectors in 32 sectors and zone #1.... In zone #17, it becomes 15 sectors. The number of total sectors of each zone is a value acquired by carrying out the multiplication of the number of physical trucks, and the number of sectors of 1 physics truck, and serves as a value shown in the last train of drawing 3 . For example, in zone #0, it becomes 84480 sectors. Therefore, as for the total number of sectors, in 84480 / 2= 42240 sector, and a land truck, in zone #0, the total number of sectors serves as 42240 sectors similarly by groove truck. And since it becomes a 6 sector =1 logic truck as mentioned above, in zone #0, a 7040 logic truck will be formed in a groove truck and a land truck, respectively.
[0033] A logic truck number is "7040" - "13859" in "0" -"7039" zone #1 at zone #0 about each of a groove truck and a land truck so that the start value of the logic truck of drawing 3 may show, although the logic truck number of "0" - "93060" is assigned in a user zone as shown in drawing 2 .... In zone #17, it becomes "89760" - "93060."

[0034] 2. A sector structure next drawing 4 - drawing 6 explain a sector format of a disk. User data are recorded on a magneto-optic disk considering a sector as a unit of record/playback. As previously shown in drawing 19 , a sector consists of a header (PURIFOMATTEDDOHEDDA) and MO area. A header is the field only for playbacks (pit area) where the so-called embossing pit was preformatted and recorded, and as shown in drawing 4 (a), the section from the TORAJISHON area TA 1 except a header to the TORAJISHON area TA 2 serves as MO area. In this MO area, the MSR effectiveness explained by drawing 18 can be acquired.
[0035] Although the byte count of each field is shown in drawing 4 (a), one sector is classified into the ALPC gap of 1 or 17 bytes of TORAJISHON area [1 byte of] TA, the sink of 27 bytes of VF [03 or 4 bytes of], 4878 bytes of data field, the buffer of 2 bytes of postamble [3 or 42 bytes of] PA, and 1 byte of TORAJISHON area TA 2 following 76 bytes of header.
[0036] Drawing 4 (b) expands and shows DDA to 76 bytes of that. It passes and DDA is considered as the configuration with which sector marks SM (8 bytes) and VFO1 (26 bytes), the address mark AM 1 (1 byte), the address ID 1 (5 bytes), postambles PA1 (1 byte) and VFO2 (26 bytes), the address mark AM 2 (1 byte), the address ID 2 (5 bytes), and a postamble PA 2 (1 byte) were arranged in order.
[0037] A sector mark SM is a mark for identifying initiation of a sector, and the pattern which is not produced in a RLL (1-7) sign is formed of embossing. The VFO field in one sector is for synchronizing VF0 (Variable Frequency Oscillator) in the PLL section of the disk drive equipment mentioned later, and consists of VFO1, VFO2, and VF03. That is, these serve as a PLL lead-in field. And VFO1 and VFO2 are formed in address part of embossing. In addition, VF03 is formed in data division, as shown in drawing 4 (a), and in case record actuation is performed to the sector, it is recorded on an optical MAG target.
[0038] In VFO1 and VFO2, the signal of the predetermined pattern for performing an aiming at read-out PLL [data / (address) / in a header] lead-in (generation of a playback clock) is recorded. On the other hand by VFO3, the signal of the predetermined pattern for performing a PLL lead-in (generation of a playback clock) aiming at read-out of the data currently recorded in MO area is recorded. For example, VF03 has the pattern (2T pattern) with which '0' of a channel bit and '1' appear by turns, respectively. Therefore, when time amount corresponding to the time amount length of an one-channel bit was set to T and the VFO field is reproduced, the regenerative signal which level reverses to every 2T is acquired.
[0039] The address marks AM1 and AM2 are used in order to give the cutting tool synchronization for the consecutive addresses ID1 and ID2 to equipment, respectively, and they have a predetermined pattern. The addresses ID1 and ID2 have a CRC cutting tool for error detection to the information on the address of a sector, i.e., a track number, and a sector number, and such information. Although 5 bytes of each addresses ID1 and ID2 serve as address information of a sector, let these be the same data. That is, in one sector, the address is being recorded twice.
[0040] The postambles PA1 and PA2 in a header and PA3 in MO area have a predetermined pattern, respectively.
[0041] The structure of the addresses ID1 and ID2 is shown in drawing 5 . As shown in drawing 5 (a), respectively, 2 bytes of logic truck number, 1 byte of sector number, and 2 bytes of CRC are assigned to 5 bytes each of addresses ID1 and ID2. Moreover, it is assigned like drawing 5 (b), and ID number and bit 6 and 5 are made into a logic truck number, and let bit4-bit0 be a sector number for bit7. [8 bits / in 1 byte made into a sector number]
[0042] In this example, a land / groove recording method is adopted and it mentions later in detail, but the arrangement on the truck of the pit as the addresses ID1 and ID2 is formed in the location displaced to the disk radial more nearly mutually than a groove truck core. And although the addresses ID1 and ID2 are fundamentally made into the same value, let the address for groove trucks in the address ID 1, and the address ID 2 be the addresses for land trucks. For this reason, ID number is defined as bit7, it considers as this ID number = "0" in the address ID 1, and it is shown that it is the address corresponding to a groove truck. On the other hand, in the address ID 2, it considers as ID number = "1", and it is shown that it is the address corresponding to a land truck.
[0043] The number of trucks becomes twice [about] by a land / groove recording method being

adopted, and description of a logic truck number stops moreover, 2 bytes (16 bits) of drawing 5 (a) being of use for this reason. Therefore, like drawing 5 (b), 2 bits of bit 6 and 5 are assigned to a logic truck number, and is defined as describing 2 bits of high orders as a logic truck number here. That is, it is supposed that it is possible to describe a logic truck number by 18 bits.

[0044] A sector number is described by bit4-bit0. Let this be a value with the same addresses ID1 and ID2. However, although it is the same value, the sector to which a sector number points by the exception of a groove truck / land truck being described by the above-mentioned ID number serves as another sector physically. If it puts in another way, the sector number of the sector of the groove truck formed following the addresses ID1 and ID2 and the sector of a land truck is shown by the same value, respectively. In addition, although the sector number of the addresses ID1 and ID2 is the same value, since ID numbers differ, the values of CRC shown in drawing 5 (a) differ in the address ID 1 and the address ID 2.

[0045] In drawing 4 (a), the ALPC gap area allotted through the TORAJISHON area TA 1 following a header is prepared for the test of reservation of the time amount which the processing after completing the read of a header takes to equipment, permission of a gap of the next location of VF03, and the laser power at the time of record etc.

[0046] The sink (4 bytes) is prepared in order that equipment may obtain the cutting tool synchronization for the continuing data field, and it has a predetermined bit pattern. A data field is prepared in order to record user data. 4096 bytes is secured as user data, and it is that error detection, the parity for correction, etc. are recorded in addition to it, and becomes 4878 bytes. In addition, the RISHINKU pattern for the synchronization with a position is arranged on the data field. The buffer field is used as tolerance to an electric or mechanical error.

[0047] The contents of a sink and the data field are shown in drawing 6 . 4760 bytes of the part except the sink cutting tools SB1-SB4 who become 4 bytes of sink in drawing 6 , i.e., 119rows(es)x40column, and 118 bytes of lysine KUBAITO (RS1, RS1) - (RS59, RS59) used as RISHINKU turn into 4878 bytes as a data field. 1row, i.e., 40 bytes, serves as interleave length.

[0048] 4096 bytes of user data is recorded on a data field as data bytes D1-D4096 in the range of 103rows(es) of the 1st row - the 103rd row as illustrating. Furthermore, 12 bytes of sector RITUN flag (SWF1-SWF12) and 4 bytes of CRC (C1-C4) are recorded following a data byte. Moreover, in the range of 16rows(es) of the 104th row - the 119th row, 640 bytes of error correction code ("E1, 1"- "E40, 16") is recorded.

[0049] 3. the arrangement condition of a header, and an address read-out method -- explain the address read-out method about the arrangement condition, and a groove truck and a land truck of the addresses ID1 and ID2 of a header in the disk of this example with which zoning and a sector format were specified as mentioned above. By the disk of this example, the 1st address made into the same address number in the header of a sector and the 2nd address ID1 and ID2, i.e., the addresses, are characterized by being formed in the location by which the variation rate was mutually carried out to the disk radial to hard flow from the center line of a groove truck or a land truck.

[0050] An example is typically shown in drawing 7 . The addresses ID1 and ID2 in a header are formed in the location mutually shifted to the groove truck (GT1, GT2 ...) and land truck (LT1, LT2 ...) which are formed like drawing 7 . For example, if it sees about the addresses ID1 and ID2 which the value "n" described as the same physical block address (PBA), from the center line of the groove truck GT 2, 90 degrees of addresses ID 1 will be displaced, and they will be formed in a disk periphery side. On the other hand, from the center line of the groove truck GT 2, 90 degrees of addresses ID 2 are displaced, and they are formed in a disk inner circumference side. Moreover, since this drawing 7 assumes zone #0 shown in drawing 3 and 32 sectors exist in 1 physics truck in this case, Although the physical block address "n+32" is expressed in the addresses ID1 and ID2 which adjoin a disk inner circumference side to the addresses ID1 and ID2 which the value "n" described From the center line of the groove truck GT 3, 90 degrees also of the addresses ID1 and ID2 of "n+32" are also displaced, and they are formed in a disk periphery and inner circumference side, respectively. In addition, "90 degrees" here is a value at the time of making the pitch between a groove truck and the next groove truck into 360 degrees. Moreover,

a physical block address (PBA) is a value computed by the truck number xK+ sector number, and "K" is the number of sectors of 1 logic truck (the case of this example, for example, "6").
[0051] Drawing 9 shows typically the situation of the pit of the addresses ID1 and ID2 by which a variation rate is carried out in this way. As shown in drawing, the pit of the addresses ID1 and ID2 is mutually formed in the location by which 90-degree variation rate was carried out to hard flow from the center line of a groove truck.
[0052] In addition, this drawing 7 , drawing 9 , and the drawing used for the below-mentioned explanation are the typical things aiming at expressing the location of the addresses ID1 and ID2 to the last, and differs from an actual disk face-of-a-board top somewhat. That is, as mentioned above, PURIPITTO other than address [, such as a sector mark, the address mark, and a VFO pattern,] ID 1 and ID2 is formed in a header, but in each drawing, in order to avoid complicated-ization, those publications are omitted.
[0053] The addresses ID1 and ID2 of the same value by which the variation rate was carried out like drawing 7 point to the sector on a groove truck, and the sector on a land truck, as an alternate long and short dash line shows, respectively.
[0054] If the case where disk drive equipment scans for record or playback is considered to such a disk, when scanning by applying a tracking servo to a groove truck, a broken line comes to show the scan locus SC to drawing 10 . For example, while scanning the groove truck GT 2, "n [n]" is read as a value of the addresses ID1 and ID2 by the header of the sector of PBA= "n." Moreover, with the following sector, "n+1 [n+1]" is read as a value of the addresses ID1 and ID2.
[0055] On the other hand, when scanning by applying a tracking servo to a land truck, a broken line comes to show the scan locus SC to drawing 11 . For example, while scanning the land truck LT 2, "n+32 [n]" is read as a value of the addresses ID1 and ID2 by the header of the sector of PBA= "n." Moreover, with the following sector, "n+33 [n+1]" is read as a value of the addresses ID1 and ID2. Thus, at the time of a land truck scan, the values acquired as the addresses ID1 and ID2 differ. In addition, disk drive equipment will make reverse the polarity of the tracking error signal for a tracking servo in the time of a groove truck scan and a land truck scan. This means that it can judge whether it is [current groove truck] under scan, or it is [land truck] under scan by as any the controller of disk drive equipment has set the polarity of a tracking error signal.
[0056] The value of the addresses ID1 and ID2 obtained at the time of each scan of the groove trucks GT1, GT2, and GT3 and the land trucks LT1 and LT2 was summarized to drawing 12 . Thus, while the addresses ID1 and ID2 become equivalent while the laser spot is scanning the groove truck top, and the laser spot is scanning the land truck top, predetermined difference is attached to the value of the addresses ID1 and ID2. This difference is equivalent to the number of sectors around 1 physics truck (zone # 0 "32"). Therefore, for the control section (controller) of disk drive equipment, as expected value of the address obtained at the time of a land truck scan, an actual sector address is the PBA value acquired from the address ID 2, and the expected value of the address ID 1 is (PBAof ID2)+ (the number of sectors around 1 physics truck).
It will process by carrying out. That is, an original sector address can be obtained from the value of the address ID 1 by subtracting the number of sectors around 1 physics truck.
[0057] Thus, by this example, various kinds of following advantages will be acquired by the addresses ID1 and ID2 being formed.
[0058] First, since both a groove truck and a land truck can acquire an address value twice with the addresses ID1 and ID2, it can maintain the dependability of address reading on a par with the conventional disk (for example, drawing 20 (a), (b)). That is, by groove truck, the same address value can be acquired twice as the addresses ID1 and ID2. Moreover, by land truck, by subtracting the number of sectors around 1 physics truck as mentioned above, an original address value can be acquired and the equivalent can be further obtained from the address ID 2 about the PBA value acquired from the address ID 1. By this, both a groove truck and a land truck will have the address information of two parenchyma to one sector. And what is necessary is just to be able to read at least one of the two addresses with each sector. By groove truck, if either of the addresses ID1 and ID2 can be read, a sector address can be

specified. By land truck, when the address ID 2 could be read, a sector address can be specified as it was and the address ID 1 is able to be read, a sector address can be obtained from the PBA value of the address ID 1 by subtracting the number of sectors around 1 physics truck.
[0059] Furthermore, after maintaining the dependability of address reading by double writing of the address being carried out substantially in this way and adopting a land / groove recording method, sufficient pitch is obtained to the addresses ID1 and ID2 with which both the addresses ID1 and ID2 adjoin radial. Therefore, a leakage lump of the signal from an adjoining truck like [when drawing 20 (b) explains] can be substantially suppressed to sufficient level. In order to acquire such effectiveness moreover, it is not necessary to lengthen the physical merit of PURIFOMATTEDDOHEDDA. That is, it is not necessary to arrange a header like drawing 20 (c). Therefore, the redundancy of a header can be suppressed to minimum.
[0060] Moreover, at the time of the scan of a land truck, that the difference of the number of sectors around 1 physics truck arises in the value of the addresses ID1 and ID2 also produces the advantage that the zone scanned with the value of the difference now can be pinpointed uniquely, as mentioned above. As drawing 3 explained, in zone #0-#17, it is the value from which the number of sectors around 1 physics truck differs, respectively. If it followed, for example, the difference of the value of the addresses ID1 and ID2 was a part for 32 sectors, it turns out that it turns out that it is the truck in zone #0 which is being scanned in that case, and it is zone #1 if difference is a part for 33 sectors. This serves as the technique of the ability to pinpoint the zone under current actuation easily in seeking and a still, and will become very useful.
[0061] By the disk of this example, various kinds of effectiveness is acquired according to the arrangement condition of the addresses ID1 and ID2 as mentioned above, in a land / groove recording method, redundancy of a header can be made into the minimum by this, and efficient densification can be realized by using a MSR method.
[0062] In addition, although the addresses ID1 and ID2 used as the same value shall be seen from the center line of a groove truck and shall carry out 90-degree variation rate to a periphery and inner circumference side in the above-mentioned example, the addresses ID1 and ID2 used as the same value are seen from the center line of a land truck, and may be made to carry out 90-degree variation rate to a periphery and inner circumference side. In that case, the addresses ID1 and ID2 will be detected as the same value at the time of a land truck scan, and the difference of the number of sectors around 1 physics truck will arise in the value of the addresses ID1 and ID2 at the time of a groove truck scan.
[0063] By the way, when it divides into zone #0-#17 as mentioned above by the zone CAV from which a channel frequency differs for every zone like this example, by both trucks used as a zone boundary, the location of PURIFOMATTEDDOHEDDA shifts to radial like drawing 13 . Supposing the address ID 2 of the truck by the side of Zone beta shown with the broken line exists in drawing 13 now, the address ID 2 shown with the broken line will be in the condition that sufficient pitch is not obtained to the address ID 1 of the truck by the side of Zone alpha. If the header which shifted to such radial is formed, it will cross to a number physics truck centering on a zone boundary, the cross talk by optical phase contrast will be caused to a data area, and a servo and an error rate will be affected.
[0064] So, in this example, the address ID 2 shown in drawing 13 with a broken line is making it not form, and avoids the cross talk by optical phase contrast. For example, the address ID 2 by which a variation rate will be carried out to Zone alpha side in 1 physics truck adjacent to Zone alpha by Zone beta side as shown in drawing is not formed. It is lost that this adjoins so that the pits as the addresses ID1 and ID2 may overlap between adjoining trucks, and it can avoid a cross talk. In addition, not forming the address ID 2 of the zone beta by the side of a periphery in this way may go in a number physics truck in Zone beta. You may make it not form the address ID 1 in the range of a 1 - number physics truck in the zone alpha by the side of inner circumference, of course.
[0065] By the way, when dealing with a disk, as it mentioned above, there are a physical address (PBA) and the logical address (LBA). In the disk in a format of this example, since the sector which has the same physical address information in a land truck and a group truck surely exists a lot every, the technique of dividing both with the logical address can be considered.

[0066] Then, turn up, after making the user area head of a group truck or a land truck into the LBA (logic block address) minimum value per zone and going to a zone end as the assigning method, and assign LBA succeedingly from another truck head, it is made to complete as max LBA in the zone at a zone end again, and degree LBA is taken over to the truck side of the beginning of the next zone head. For example, as shown in drawing 14 , in zone #0, LBA [0] - LBA [N] are first assigned to a groove truck. Then, LBA [N+1] is assigned to the head of a land truck, and sets the last of the land truck in zone #0 to LBA [M]. Then, by termination, LBA [M+1] - LBA [L] are assigned from the head of the groove truck of zone #1. Then, LBA [L+1] is assigned to the head of the land truck of zone #1, and sets the last of the land truck in zone #1 to LBA [K]. Thus, by assigning a logic block address, it becomes accessible from the outermost periphery side continuously.
[0067] Moreover, ranging over a zone, a logic block address may be given according to a groove truck and a land truck as other examples of an assignment. For example, like drawing 15 , LBA [0] - LBA [N] are assigned to the groove truck to zone #0-#17, continuing LBA [N+1] is assigned to the head of the land truck of zone #0, and the last of the land truck in zone #17 is set to LBA [M].
[0068] Furthermore, dividing into a physical zone and a logic zone is also considered about the zone itself. As for a physical zone, in the same area, a user zone, a control truck SFP zone, etc., a read-out frequency treats as usual the sector group which pointed out what was distinguished by purpose-oriented and divided it into the group truck and the land truck in them further as logic zones. By carrying out like this, since it can manage in the unit of the concept of a zone as usual when managing a servo parameter, and writing and a read-out related parameter, the past firmware property can be diverted easily.
[0069] As mentioned above, by this example, when adopting a land / groove recording method, and a MSR playback system, with devising arrangement of the addresses ID1 and ID2 in the header of a sector, the redundancy of PURIFOMATTEDDOHEDDA is made into the minimum and problems, such as a cross talk, can also be solved.
[0070] However, about the redundancy of a preformat field, it is related also about preformat fields, such as a control truck SFP zone shown not only in the header in a sector but in drawing 1 . In a control truck SFP zone, system information, such as disk information, such as laser wavelength, an engine speed of a spindle motor, and the optimal laser power, and the last logical address number, a data length per 1 sector, is written in by PURIPITTO in a disk manufacture process. Of course, this field cannot acquire the MSR effectiveness. Then, some or all of these preformat fields is formed as an optical MAG field, and the above-mentioned disk information and system information are written in by the MSR method with the recording apparatus of dedication in the check process after disk manufacture etc. If it is made such, the densification by the MSR effectiveness becomes possible also about disk information and system information, and the redundancy of a preformat field can be lowered. In addition, it is necessary to design a firmware so that the disk information and system information which were written in the optical MAG target cannot be rewritten with common disk drive equipment in that case.
[0071] in addition, the case where disk information and system information are written in in a check process -- a vendor -- it is also being able to manufacture various disks, without being able to write the variable of unique media dependence in arbitration, that is, changing La Stampa of a disk.
[0072] 4. The configuration of the disk drive equipment which performs record playback actuation corresponding to the disk of the example of the configuration book of disk drive equipment is shown in drawing 16 . Although the bit BAIBITTO decoding method and a Viterbi decoding method are used in the RF signal regeneration system as a regenerative apparatus of a magneto-optic disk, let the disk drive equipment of this example be disk drive equipment which has the reversion system which performs Viterbi decoding.
[0073] The magneto-optic disk 6 of this example mentioned above is in the condition by which the rotation drive was carried out with the spindle motor 9 into disk drive equipment, and informational record, playback, and elimination are performed by actuation of the optical head 7 and the bias magnet 5. The optical head 7 at the time of record, playback, and elimination and the position control (seeking, a tracking servo, thread servo) of the bias magnet 5, and the focus servo of the laser beam from the optical head 7 are performed by the biaxial device and thread device which are not illustrated. In the optical

head 7, a biaxial device holds the objective lens used as a laser outgoing end movable in the direction of a focus, and the direction of tracking, and is formed with a focal coil and a tracking coil. To a focal coil and a tracking coil, a drive current is impressed by the biaxial drive 22. Moreover, a thread device does not move the optical head 7 and the whole bias magnet 5 to the disk radial, and is driven by the thread drive which does not illustrate.

[0074] Although the rotation drive of the spindle motor 9 is furthermore carried out by the spindle drive 23, servo control of the spindle drive 23 will be carried out so that a spindle motor 9 may be considered as CAV rotation.

[0075] Let the drive controller (henceforth a controller) 2 be the part which performs the communication link with a host computer 1 while it performs various kinds of motion control as a master controller of this disk drive equipment. That is, a controller 2 controls actuation which reads the data similarly demanded according to the directions from a host computer 1 from a disk 6, and is transmitted to a host computer 1 while controlling the actuation which records the supplied data on a disk 6 according to the record directions from a host computer 1. Moreover, the controller 2 also has the function to perform encoding of data, and decoding.

[0076] Let CPU3 be the part which controls each part based on directions of a controller 2 for record playback actuation. DSP21 functions as a servo processor and performs control of the biaxial drive 22, the spindle drive 23, and the thread drive that is not illustrated. Moreover, the bias magnet 5 which impresses an external magnetic field to a magneto-optic disk 6 will also control current impression actuation of the magnet drive 24 to mention DSP21 later, although a drive current is given by the magnet drive 24.

[0077] At the time of record, a controller 2 encodes the user data which should be recorded based on a receipt and the user data as an information word according to the command of a host computer 1, and generates the RLL (1 7) sign as a symbolic language. This symbolic language is supplied to the laser power control section (it is hereafter written as LPC) 4 as record data WDATA. Moreover, a controller 2 directs the luminescence actuation and its timing as a recording mode to LPC4 as a WGATE signal.

[0078] At the time of playback, at the time of record, LPC4 generates a laser drive current so that the laser output from the optical head 7 may be performed in each at the time of elimination. In addition, according to directions of CPU3, it is set up at the time of record at the time of playback, the laser luminescence level in each, i.e., the laser drive current value, at the time of elimination. When record is directed by the WGATE signal, LPC4 records by forming the pit train which controls the laser power of the optical head 7 and has magnetic polarity on a magneto-optic disk 6 corresponding to the supplied record data WDATA. In the case of this record, the bias magnet 5 gives a bias field to a magneto-optic disk 6.

[0079] The following actuation is performed by control of a controller 2 and CPU3 at the time of playback.

[0080] A controller 2 supplies a RGATE signal and an IDGATE signal to LPC4 and the RF block 20, and performs playback motion control. That is, with a RGATE signal, a controller 2 directs regeneration to the RF block 20 while directing continuation luminescence by the laser power as a regeneration level to LPC4.

[0081] Moreover, according to a header and MO area existing in a sector format of a disk 6, the timing of operation in each field is directed by the IDGATE signal, and actuation of LPC4 and the RF block 20 is performed according to this. For example, an IDGATE signal is outputted as a signal which shows the period which is equivalent to MO area (data area) by the controller 2. In addition, as mentioned above, in the magneto-optic disk 6, the record film corresponding to a MSR method in MO field is formed.

[0082] First, LPC4 generates a laser drive current according to a RGATE signal at the time of playback, and performs the laser output for playback actuation from the optical head 7 at it. At this time, although the bias magnet 5 also performs field impression actuation according to a RGATE signal, it is later mentioned about that actuation. The optical head 7 irradiates a laser beam at a magneto-optic disk 6, and receives the reflected light produced by it. Furthermore, data processing of the signal according to the amount of reflected lights generates various signals. That is, they are sum signal R+, difference signal R-

and the focal error signal that is not illustrated, a tracking error signal, etc. In addition, information reading from MO area of a magneto-optic disk 6 will be performed by the MSR playback system mentioned above.

[0083] Sum signal R+ is supplied to a changeover switch 10, after a gain adjustment etc. is made by amplifier 8a. Moreover, difference signal R- is supplied to a changeover switch 10, after a gain adjustment etc. is made by amplifier 8b. Gain setting in Amplifier 8a and 8b is performed by CPU3. In addition, the focal error signal and tracking error signal which are not illustrated are supplied to DSP21, and are used for servo control. That is, DSP21 supplies a focal driving signal and a tracking driving signal to the biaxial drive 22 based on a focal error signal and a tracking error signal, and makes the drive current according to a focal driving signal and a tracking driving signal supply to a biaxial device. Moreover, DSP21 is generating a thread driving signal and supplying it to the thread drive which is not illustrated from a tracking error signal, and performs actuation of a thread device.

[0084] A changeover switch 10 performs change actuation according to an IDGATE signal, and supplies sum signal R+ or difference signal R- to the filter section 11. That is, in the sector format of a magneto-optic disk 6, the signal reproduced from a header supplies sum signal R+ to the filter section 11 at the period supplied to a changeover switch 10. Moreover, the signal reproduced by the MSR method supplies difference signal R- to the filter section 11 from MO area where record is performed on the optical MAG target at the period supplied to a changeover switch 10.

[0085] The filter section 11 consists of waveform equalizers which perform the low pass filter and waveform equalization which perform a noise cut. And equalizing of the inputted signal is carried out so that the partial response property which suits the Viterbi decoding approach which the Viterbi decoder 13 performs may be acquired. A/D converter 12 performs A/D conversion for the output of the filter section 11 according to the playback clock DCK, and outputs regenerative-signal value z [k]. The Viterbi decoder 13 generates the decode data DD by the Viterbi decoding approach based on regenerative-signal value z [k]. These decode data DD are a maximum-likelihood-decoding sequence over record data. Therefore, when there is no decode error, the decode data DD are in agreement with record data.

[0086] The decode data DD are supplied to a controller 2. As mentioned above, record data are the symbolic language generated by coding of channel coding etc. from user data. Therefore, if a decode error rate is low enough, it can be considered that the decode data DD are record data as a symbolic language. A controller 2 reproduces user data etc. by performing decryption processing corresponding to coding of above-mentioned channel coding etc. to the decode data DD.

[0087] The playback clock DCK for such regeneration is generated by the PLL section 14. That is, the output of the filter section 11 is supplied also to the PLL section 14, and the PLL section 14 generates the playback clock DCK by PLL actuation to the supplied signal. The playback clock DCK is supplied to a controller 2, A/D converter 12, and Viterbi decoder 13 grade, and actuation of these parts is performed to the timing according to the playback clock DCK.

[0088] 5. record playback actuation -- the flow chart of the record or regeneration to the disk 6 of this example by such disk drive equipment is shown in drawing 17 . If a light instruction or a lead instruction is received from a host computer 1 as step F101, a controller 2 will perform a command interpretation at step F102. The command as a light instruction or a lead instruction is transmitted with the data length from the starting address which should perform store or read-out, and a starting address. It interprets access to which of a land truck and a groove truck from the starting address transmitted first a controller 2 performs to such a command. And it changes into the address (PBA) on a disk as an access purpose.

[0089] Then, a controller 2 sets up the parameter according to a land/groove as step F103. That is, according to whether it is land truck access and whether it is groove truck access, each value of a disk controller system parameter, a servo-system parameter, a read-out system constant and a parameter, a write-in system constant and a parameter, and laser power is set up. Each set point is made to reflect in each part by CPU3. And at step F104, seeking (access) to a starting address is performed by DSP21. In addition, the polarity of a tracking error signal is made reversed by the case where they are the case where the access purpose value is a land truck, and a groove truck.

[0090] When the optical head 7 arrives at the address for the purpose of access, record or read-out actuation will be performed as step F105. That is, in the case of a light command, actuation which records the data transmitted from the host computer 1 is performed, on the other hand, in the case of a lead command, data are read from a disk 6, and it performs processing transmitted to a host computer 1. In such a process of operation, address distinction under the address distinction and record playback under seeking is performed by reading the addresses ID1 and ID2 arranged alternately as mentioned above.

[0091] As mentioned above, although the disk and disk drive equipment as a gestalt of operation of this invention have been explained, it cannot be overemphasized that this invention is not limited to the above-mentioned disk formatting, an equipment configuration, etc., and various kinds of modifications by within the limits of the summary can be considered.

[0092]

[Effect of the Invention] So that the above explanation may show the disk-like record medium of this invention By recording the 1st and 2nd address made into the same address number in the header field The dependability of address read-out actuation is secured as usual. On it the 1st and 2nd address Alternate, Namely, since the 1st address and 2nd address are arranged as formed in the location by which the variation rate was mutually carried out to the disk radial to hard flow from the center line of a groove truck or a land truck, A radial contiguity distance of each address can extend and the effect of a cross talk is canceled. And as a result, it becomes unnecessary to form a header field in redundancy, and, also in the case of groove recording method [a land /], densification of a disk can be realized effectively. Of course, a record playback field (MO area) is that the record layer is formed so that a magnetic super resolution playback system (MSR method) may become possible, and together with a land / groove recording method, the densification of it becomes possible, and it can promote large capacity-ization.

[0093] Moreover, one side is made to consider as the address number corresponding to the sector on a groove truck, and the address number corresponding to the sector on a land truck in another side, and the 1st address and 2nd address which were made into the same address number can detect the address of the sector of each truck correctly from the 1st address and 2nd address which have been arranged alternately.

[0094] Moreover, the cross talk by optical phase contrast is cancelable in the border area of a zone because at least one of the 1st address and the 2nd address is not made not to be formed. Furthermore, in the range crossed to the inside of one zone, or two or more zones, the suitable condition for a continuation sequential access etc. is realizable by the address which is logically different on a groove truck and a land truck being assigned. Moreover, if it is made to divide into a land zone and a groove zone in one physical zone, a servo and the ease of parameter management of record playback will also be acquired.

[0095] As disk drive equipment of this invention, with the address value read from the 1st address and 2nd address, the address of the sector of a groove truck or the address of the sector of a land truck is distinguished, by performing the record actuation or playback actuation by the head means, it is adapted for the above-mentioned disk-like record medium, and suitable record playback actuation can be performed. Moreover, if based according to the condition whether to be in the scan condition over a groove truck, or to be in the scan condition over a land truck, the address of the sector of a groove truck or the address of the sector of a land truck can be distinguished correctly.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the explanatory view of the zone configuration of the disk of the gestalt of operation of this invention.
[Drawing 2] It is the explanatory view of the zone layout of the disk of the gestalt of operation.
[Drawing 3] It is the explanatory view of the number of sectors around the truck of each zone of the disk of the gestalt of operation.
[Drawing 4] It is the explanatory view of the sector structure of the disk of the gestalt of operation.
[Drawing 5] It is the explanatory view of the sector structure of the disk of the gestalt of operation.
[Drawing 6] It is the explanatory view of the data field of the sector of the disk of the gestalt of operation.
[Drawing 7] It is the explanatory view of arrangement of the address information of the disk of the gestalt of operation.
[Drawing 8] It is the explanatory view of the land / groove recording method of the disk of the gestalt of operation.
[Drawing 9] It is the explanatory view of the address arrangement condition of the disk of the gestalt of operation.
[Drawing 10] It is the explanatory view of address read-out actuation of the disk of the gestalt of operation.
[Drawing 11] It is the explanatory view of address read-out actuation of the disk of the gestalt of operation.
[Drawing 12] It is the explanatory view of the read-out address at the time of actuation of the disk of the gestalt of operation.
[Drawing 13] It is the explanatory view of address arrangement of the zone boundary of the disk of the gestalt of operation.
[Drawing 14] It is the explanatory view of the example of a logical address assignment of the disk of the gestalt of operation.
[Drawing 15] It is the explanatory view of the example of a logical address assignment of the disk of the gestalt of operation.
[Drawing 16] It is the block diagram of the disk drive equipment of the gestalt of operation.
[Drawing 17] It is the flow chart of record regeneration of the disk drive equipment of the gestalt of operation.
[Drawing 18] It is the explanatory view of MSR playback actuation.
[Drawing 19] It is the explanatory view of a sector structure.
[Drawing 20] It is the explanatory view of the redundancy in a land / groove record.
[Description of Notations]
1 Host Computer, 2 Biaxial Drive, 23 Spindle Drive, 24 Magnet Drive Drive Controller, 3 CPU, 4 Laser Power Control Section, 5 Bias Magnet, 6 Disk, 7 Optical Head, 8 Amplifier, 9 Spindle Motor, 10 Changeover Switch, 11 Filter Section, 12 A/D Converter, 13 Viterbi Decoder, 14 The PLL Section, 21

DSP, 22

[Translation done.]

* NOTICES *

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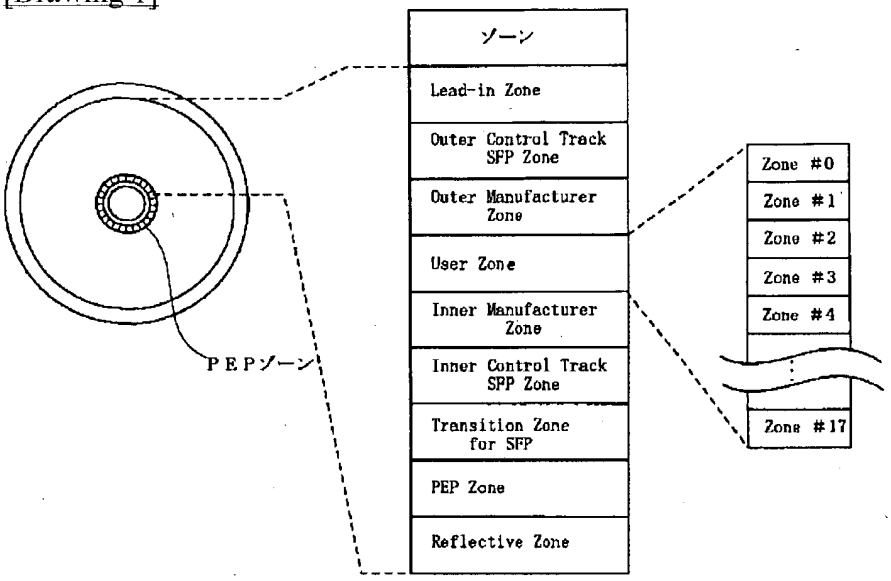
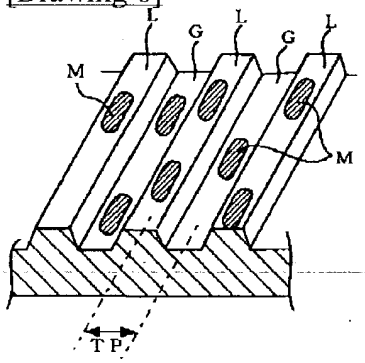
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 8]



[Drawing 2]

	半径位置 (mm)	論理トラック	
		論理トラックナンバ	数
-Lead-In Zone	62.50 to 62.30	-1568 to -785	784
-Outer Control Track SFP Zone	62.30 to 62.25	-784 to -593	192
-Outer Manufacturer Zone	62.25 to 62.10	-592 to -1	592
(Guard Band)	(62.25 to 62.25)	-592 to -580	13
(Test Zone for manufactures)	(62.25 to 62.24)	-579 to -554	26
(Test Zone for drives)	(62.24 to 62.10)	-553 to -14	540
(Guard Band)	(62.10 to 62.10)	-13 to -1	13
-User Zone	62.10 to 29.79	0 to 93059	93060
-Inner Manufacturer Zone	29.79 to 29.55	93060 to 93494	435
(Guard Band)	(29.79 to 29.78)	93060 to 93066	7
(Test Zone for drives)	(29.78 to 29.56)	93067 to 93474	408
(Test Zone for manufactures)	(29.56 to 29.55)	93475 to 93487	13
(Guard Band)	(29.55 to 29.55)	93488 to 93494	7
-Inner Control Track SFP Zone	29.55 to 29.5171	93495 to 93554	60
-Transition Zone for SFP	29.52 to 29.50	93555 to 93585	31
-Control Track PEP Zone	29.50 to 29.00	-	-
-Reflective Zone	29.00 to 27.00	-	-

Track Pitch: 0.68 (μm/bit)

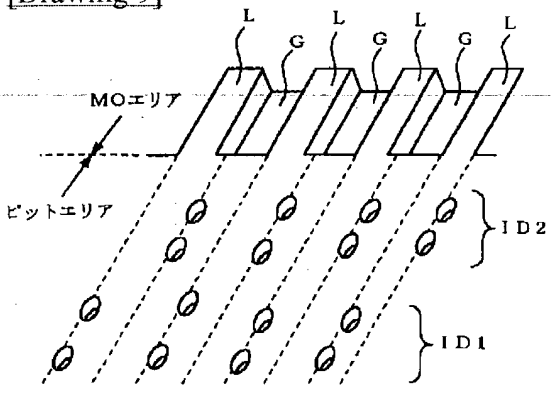
[14×4096byte/Sectors]

[Drawing 3]

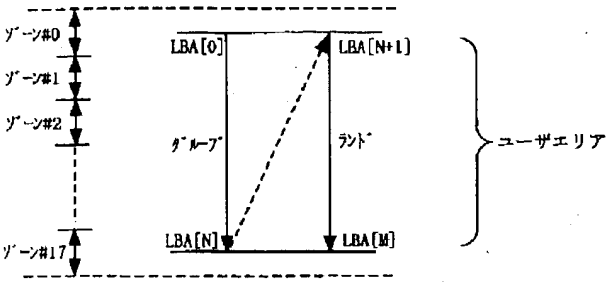
ゾーンナンバ	グループ (G) ランド (L)	物理トラック/ゾーン	半径位置 (inner)	セクタ数/物理トラック	記録線密度 (μm/bit)	物理トラック数 (G)	物理トラック数 (L)	論理トラックNo. スタート (G)	論理トラックNo. スタート (L)	ランド&グループトータルセクタ数
#0	G	2640	60.30	32	2.89E-06	7040	-	0		84480
	L						7040		0	
#1	G	2640	58.51	31	2.89E-06	6820	-	7040		81840
	L						6820		7040	
#2	G	2640	56.71	30	2.90E-06	6600	-	13860		79200
	L						6600		13860	
#3	G	2640	54.92	29	2.90E-06	6380	-	20460		76560
	L						6380		20460	
#4	G	2640	53.12	28	2.91E-06	6160	-	26840		73960
	L						6160		26840	
#5	G	2640	51.33	27	2.91E-06	5940	-	33000		71280
	L						5940		33000	
#6	G	2640	49.53	26	2.92E-06	5720	-	38940		68640
	L						5720		38940	
#7	G	2640	47.74	25	2.93E-06	5500	-	44660		66000
	L						5500		44660	
#8	G	2640	45.94	24	2.93E-06	5280	-	50160		63360
	L						5280		50160	
#9	G	2640	44.15	23	2.94E-06	5060	-	55440		60720
	L						5060		55440	
#10	G	2640	42.35	22	2.95E-06	4840	-	60500		58080
	L						4840		60500	
#11	G	2640	40.56	21	2.96E-06	4620	-	65340		55440
	L						4620		65340	
#12	G	2640	38.76	20	2.97E-06	4400	-	69960		52800
	L						4400		69960	
#13	G	2640	36.97	19	2.98E-06	4180	-	74360		50160
	L						4180		74360	
#14	G	2640	35.17	18	3.00E-06	3960	-	78540		47520
	L						3960		78540	
#15	G	2640	33.38	17	3.01E-06	3740	-	82500		44880
	L						3740		82500	
#16	G	2640	31.58	16	3.03E-06	3520	-	86240		42240
	L						3520		86240	
#17	G	2640	29.79	15	3.04E-06	3300	-	89760		39600
	L						3300		89760	

ユーザゾーン

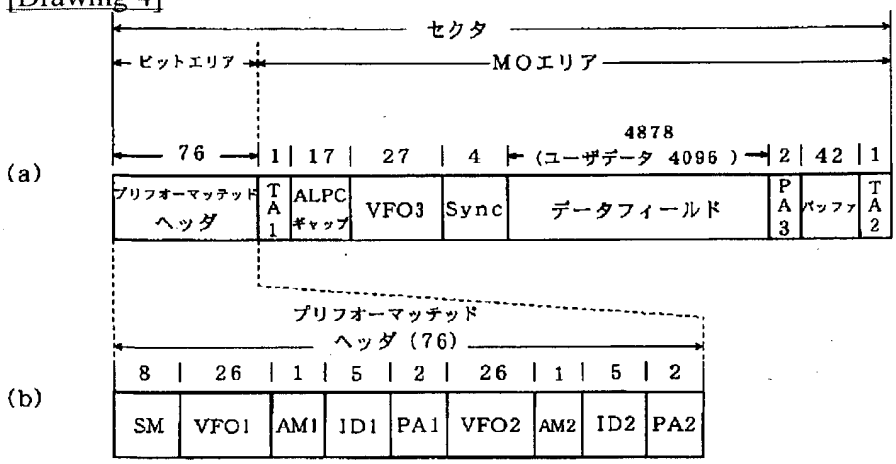
[Drawing 9]



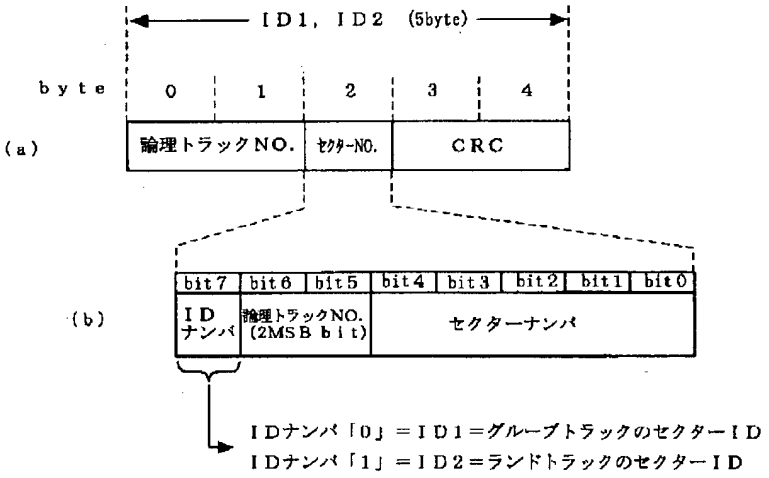
[Drawing 15]



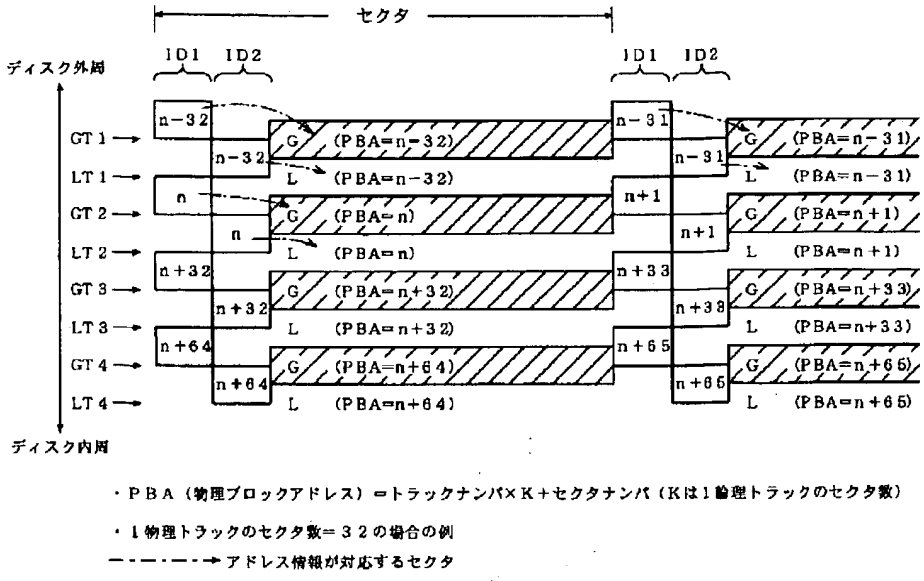
[Drawing 4]



[Drawing 5]



[Drawing 7]

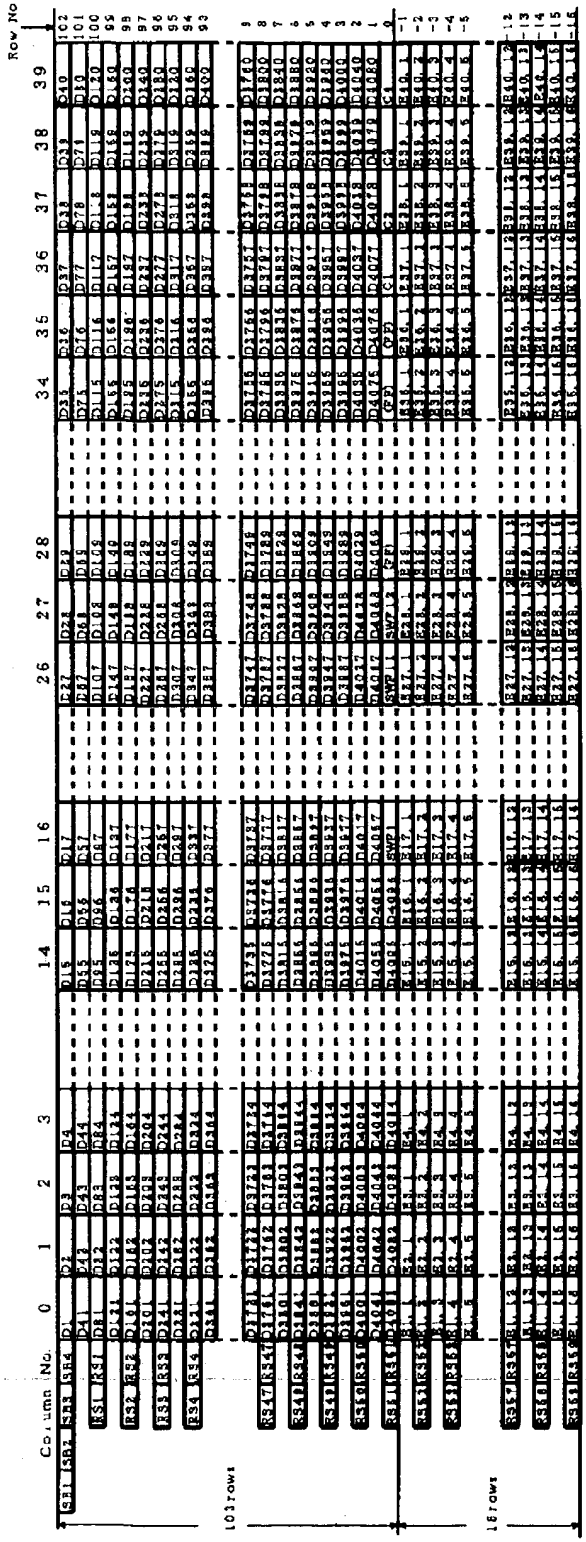


・ＰＢＡ（物理ブロックアドレス）＝トラックナンバ×Ｋ＋セクタナンバ（Ｋは１論理トラックのセクタ数）

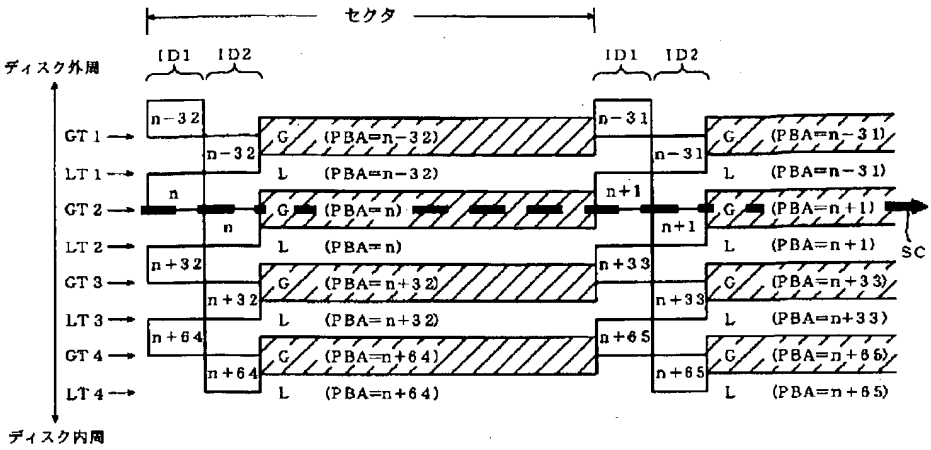
・１物理トラックのセクタ数＝３２の場合の例

－・－・－・－→アドレス情報が対応するセクタ

[Drawing 6]


D:Data-Byte
SWF:Sector Written Flag-Byte
C:CRC-Byte
E:Error Correction-Code-Byte
SB:Sync Byte
RS:ReSync Byte

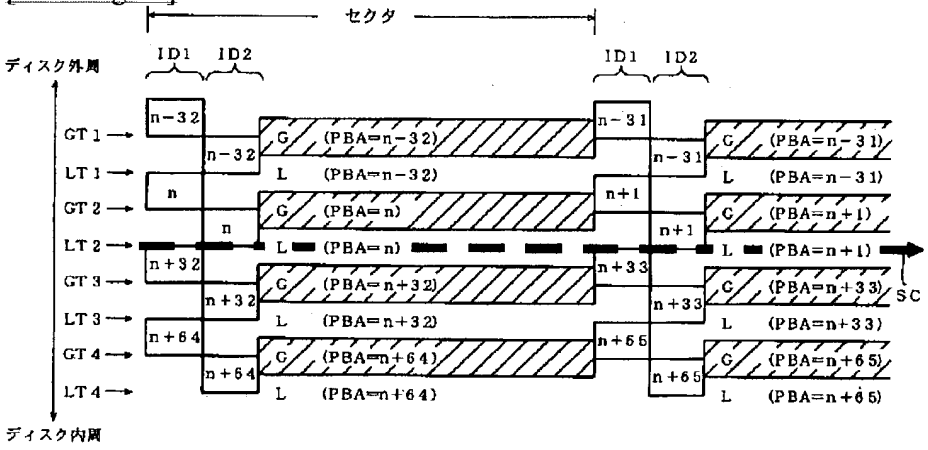
[Drawing 10]



・PBA（物理ブロックアドレス）＝トラックナンバ×K＋セクタナンバ（Kは1論理トラックのセクタ数）

・1物理トラックのセクタ数＝32の場合の例

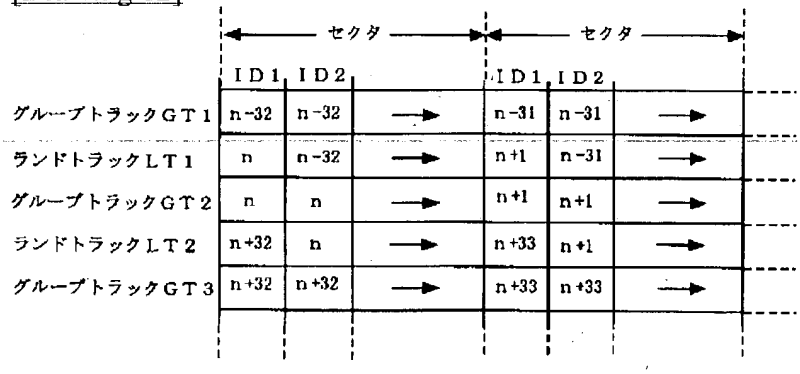
[Drawing 11]



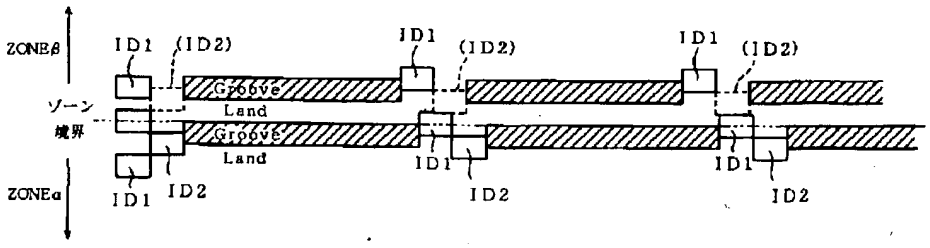
・PBA（物理ブロックアドレス）＝トラックナンバ×K＋セクタナンバ（Kは1論理トラックのセクタ数）

・1物理トラックのセクタ数＝32の場合の例

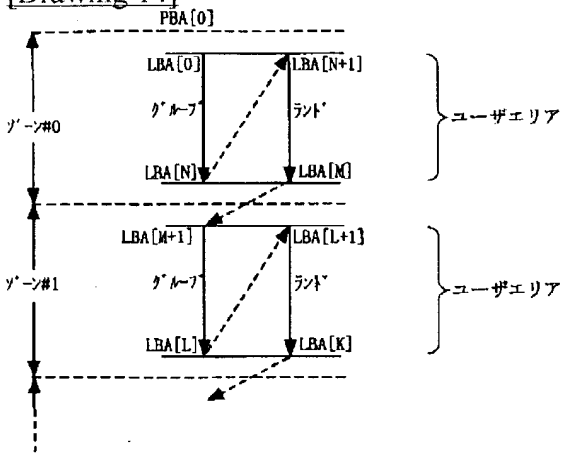
[Drawing 12]



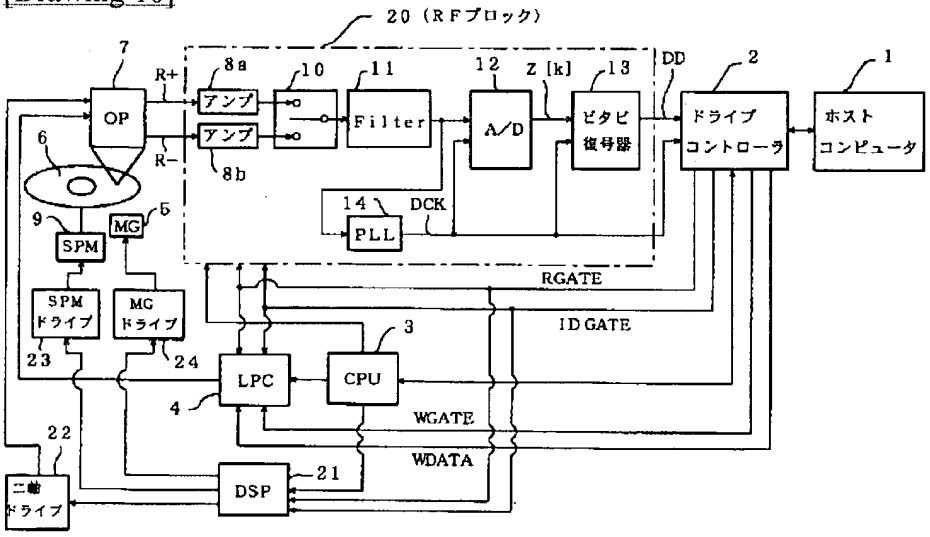
[Drawing 13]



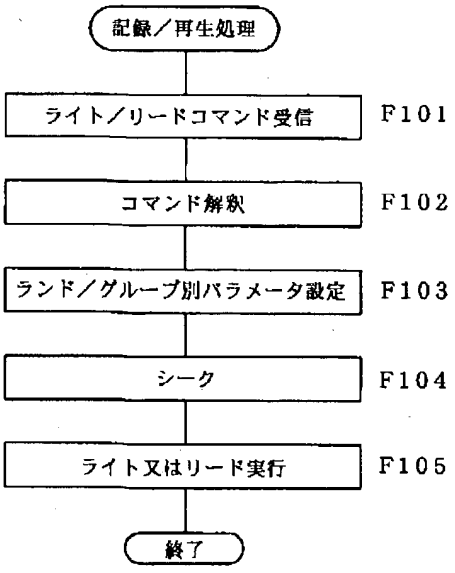
[Drawing 14]



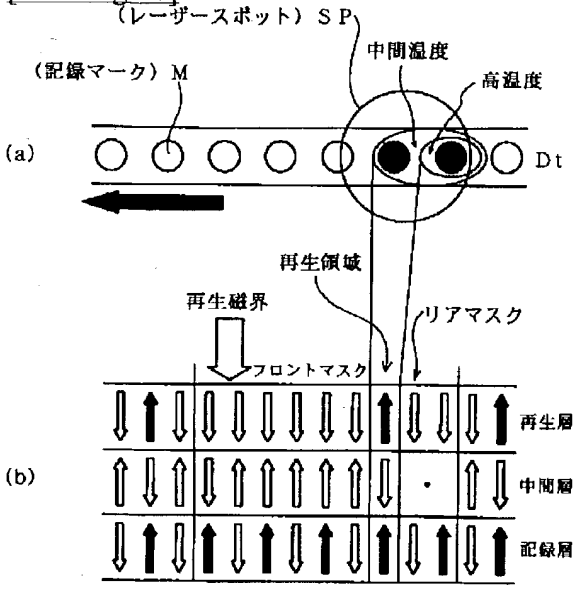
[Drawing 16]



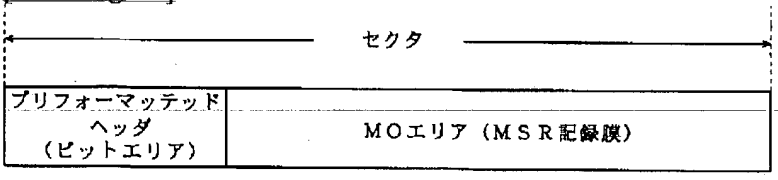
[Drawing 17]



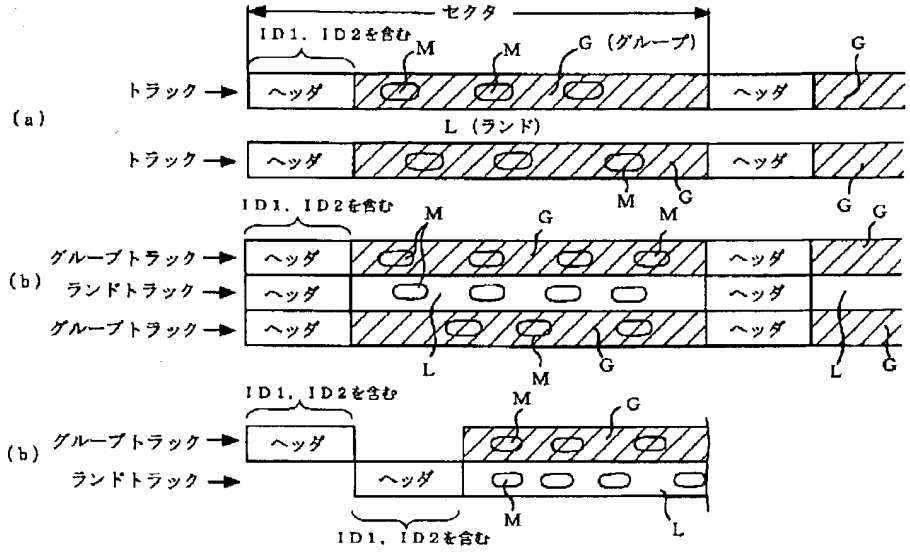
[Drawing 18]



[Drawing 19]



[Drawing 20]



[Translation done.]